

CLAIMS

What is claimed is:

1. An electronic circuit system named Mobile Safety Communication (MSC) device embedded into a rearview/side mirror of a vehicle comprising:
 - a GPS receiver circuit module with a planar antenna;
 - a wireless Communication circuit module with a planar antenna and a USB interface;
 - a plurality optical lenses and CCD/CMOS sensors with single JPEG/MPEG compression circuit module and a USB interface;
 - a RISC CPU based central control module circuit having a plurality of UART serial control ports, a plurality of USB device control ports, a plurality of USB host control ports, an Ethernet network ports, a DRAM and Flash Memory controllers, and the central control processor executing MSC software;
 - a Real-time clock with battery;
 - a Smart Card Access host electronics module;
 - a Flash memory storage;
 - a Lithium-ion battery;
- 5 vibration and motion sensor/gauge with a micro-controller;
- 10 both USB Host and USB Device outlets;
- 15 Ethernet Communication outlet;
- 20 wherein all of these electronics circuit modules soldered in a PCB and embedded into the rearview or side mirror of a vehicle.

2. The Mobile Safety Communication (MSC) device according to claim 1,
further molded into stand-alone unit is mounted at the proper position to the
windshield glass of a vehicle.
- 5 3. The MSC device according to claim 2, wherein the proper positions of the
windshield glass are mounted at the highest position for better wireless
communication and with GPS planar antenna facing the sky and better visual
recording positions of a vehicle.
- 10 4. The MSC device according to claim 1, an electronic circuit IC (Integrated
Circuit) package in a SOC (System On Chip) form that comprising:
a RISC CPU central control module;
a digital signal processing part of GPS receiver module;
a digital signal processing part of wireless Communication module;
a digital camera pixel bus with JPEG/MPEG compression circuit module;
15 a plurality UART serial I/O ports;
a flash memory;
a plurality USB host and device control ports;
an Ethernet communication circuit.
- 20 5. The MSC device according to claim 1, wherein a wireless communication
module that includes but is not limited to GMS, CDMA, 802.11, MURS,
FRS, GMRS, HAM, CB radio communication with planar antennas

embedded into the vehicle's rearview or side mirror.

6. The MSC device according to claim 2, wherein a wireless communication module that includes but is not limited to GMS, CDMA, 802.11, MURS, FRS, GMRS, HAM, CB radio communication with planar antennas embedded into stand-alone unit is mounted at the proper position to the windshield glass of a vehicle.
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7. The MSC device according to claim 5, wherein a printed circuit trace (FR-4) antenna, a ceramic chip antenna or a PIFA antenna of the wireless communication is applied to the rearview/side mirror of a vehicle.
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8. The MSC device according to claim 6, wherein a printed circuit trace (FR4) antenna, a ceramic chip antenna or a PIFA antenna of the wireless communication applied to a stand-alone unit which is mounted at the proper position to the windshield glass of a vehicle.
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9. The MSC device according to claim 1, wherein a printed circuit (FR4) trace antenna, multi-layer ceramic chip antenna or PIFA antenna of a GPS receiver is glued on the windshield glass with a pig-tail coax cable connected to the GPS receiver module.
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10. The MSC device according to claim 9, further the planar antenna of preferred ceramic chip antenna forming into the attachment part of a rearview mirror

that sticks on the windshield glass, holds the GPS chip antenna for better reception of GPS signals.

11. The MSC device according to claim 1, wherein a contact or a contactless
5 Smart Card reader device is embedded into the rearview/side mirror of a vehicle that serves as a second key for an anti-car-theft device.
12. The MSC device according to claim 2, wherein a contact or a contactless
10 Smart Card reader device is embedded into a stand-alone unit that serves as a second key for an anti-car-theft device.
13. The MSC device according to claim 5, wherein the wireless communication module controlled by the central control that serve as a radio beacon for car theft alarm, emergency help beacon, receiving internet data communication
15 signals that includes but is not limited to data/voice/video information, earthquake alarm, tornado alarm, enemy attack alarm and wireless broadband communication terminal to a PC, notebook PC or PDA.
14. The MSC device according to claim 1, wherein a Flash memory storage
20 embedded into the rearview/side mirror of a vehicle in the form of Smart Media Card, Compact Flash Card, Secure Digital Card, Multi-Media Card or plan Flash memory IC soldered in the PCB of a MSC.

15. The MSC device according to claim 1, wherein an Ethernet Communication
Outlet is implanted in the rearview/side mirror of a vehicle.
16. The MSC device according to claim 2, wherein an Ethernet Communication
5 Outlet is implanted in the stand-alone unit version of MSC device.
17. The MSC device according to claim 1, wherein both the USB host and USB
device outlets is embedded in the rearview/side mounted mirror of a vehicle.
- 10 18. The MSC device according to claim 2, wherein both the USB host and USB
device outlets is embedded into the stand-alone version of MSC device.
- 15 19. The MSC device according to claim 1, further with the USB/Ethernet outlet
and the connection, between a MSC host to the mass storage Hard Disk for
the commercial vehicle, records long periods of driving via the USB or an
Ethernet interface.
20. The MSC device according to claim 1, wherein both the front-view and
rearview wide-angle view lenses are embedded into the rearview/side mirror
20 in a camouflaged method where the LED flash turns on when camera shuts
during the night or dark moment.
21. The MSC device according to claim 19, wherein a multiplexer circuit that
selects among plurality of CCD/CMOS lenses for digital camera

compression module to reduce the redundancy of MPEG/JPEG compression circuit.

22. The MSC device according to claim 19, wherein the wide angle view of the lenses is equalized to compensate the driver's head and rearview which resides behind the rearview mirror where portions of the reflecting material is processed in a way such that the light reflects less for visual recording.
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23. The MSC device according to claim 1, wherein the operation method of the MSC functions including:
 - a vehicle accident emergency alarm activation;
 - an anti-theft alarm activation;
 - a voice/motion recording scheme coordinated with the MSC motion sensor/gauge;
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- a digital video recording scheme coordinated with the MSC motion sensor/gauge;
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- an earthquake, tornado and enemy attack warning scheme;
- a built-in Flash Memory of MSC downloaded to USB mobile driver to retrieve the video/voice/motion recording when an external USB mobile driver is plugged in to the MSC USB device outlet;
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- the transferring from DRAM to Flash memory when vehicle power off and built-in Lithium-ion battery kicked on;
- MSC device works as a USB wireless communication adaptor when connected to a USB host such as a laptop PC for wireless

communication;

MSC device works as a USB GPS receive adaptor when connected to a USB host such as a laptop PC for mapping and display;

MSC device as a USB voice communication adaptor when connected to a

5 USB host such as a laptop PC;

MSC device as a USB digital camera adaptor when connected to a USB host

such as a laptop PC;

24. The MSC device according to claim 1, wherein a double spring attached

10 metal ball based acceleration/de-acceleration sensor/gauge for detecting and

 measuring the acceleration, de-acceleration, vibration and flip over

 conditions of a vehicle.

25. The MSC device according to claim 24, further comprising a micro-

15 controller to identify significant instances to the central control module to

 coordinate the video/voice/motion recording and alarm/emergency

 activation. This micro-controller also takes the vehicle's speedometer input

 to consolidate with the motion gauge/sensor to record more complete vehicle

 motion data in the Flash memory.

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26. The MSC device according to claim 1, wherein the USB interfaces for

 connecting between the central control to the multiple MSC peripheral

 modules comprising:

 a wireless communication module with USB interface;

a voice communication and compression module with USB interface;
a multiple CCD/CMOS lenses with single JPEG/MPEG compression module
with USB interface;
USB outlet to external MSC devices;

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27. The MSC device according to claim 26, wherein the Central Control utilized
a Samsung RISC CPU S3C2410X and GPS module utilized a ST Micro-
electronics STB5610, ST20-GPS chip set and wireless communication
module utilized a TI TNETW1100B and JPEG/MPEG compression utilized
10 a DIVIO NW800 and voice communication module utilized TigerJet ST560
and USB hub controller utilized the ATMEL AT43312 to compose the main
electronic parts of MSC.

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